REMARKS

The title and claims 4-14 and 16-22 have been amended, and claims 1-3 and 15 have been cancelled.

Attached hereto is an Appendix entitled "Version with Markings to Show Changes Made" which is a marked-up version of the portions of the application which have been amended by the present amendment, with brackets indicating deleted matter and underlining indicating added matter.

On pages 2-3 of the Office Action of March 13, 2002, the Examiner refers to "[a]pplicant's arguments filed 1/26/02". However, the arguments referred to by the Examiner actually appear in the preliminary amendment which was filed on January 28, 2002.

On page 1 (the Office Action Summary) of the Office Action of March 13, 2002, indicates that claim 20 is rejected. However, the Examiner has not actually set forth a rejection of claim 20 in the body of the Office Action on pages 2-15 of the Office Action. Accordingly, in the absence of a rejection of claim 20, it is submitted that the correct status of claim 20 is that claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Accordingly, claim 20 has been rewritten in independent form including all of the limitations of the base claim and any intervening claims, such that claim 20 as amended by the present amendment is identical to claim 20 as it was considered by the Examiner in the Office Action of March 13, 2002, except that

claim 20 is now in independent form. In light of this, it is submitted that the Examiner cannot make the next Office Action final if that Office Action includes any rejection of claim 20 on any ground.

Since claim 20 has not actually been rejected and has now been rewritten in independent form, it is submitted that claim 20 is now in condition for allowance, and an indication to that effect is respectfully requested.

Claims 1-14, 19, and 21-22 were rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicants regard as the invention due to the deficiencies in the language of claims 1 and 21-22 identified by the Examiner on pages 3-4 of the Office Action of March 13, 2002.

It is noted that claims 16-18 as they were considered in the Office Action of March 13, 2002, depended from independent claim 1, and accordingly it is not clear why claims 16-18 were not also included in this rejection.

In any event, the rejection of claims 1-3 has been rendered moot by the cancellation of claims 1-3.

Claim 4 has been rewritten in independent form including all of the limitations of cancelled base claim 1 and cancelled intervening claim 2, with changes being made to the language of cancelled base claim 1 to eliminate the deficiencies identified by the Examiner.

Claim 8 has been rewritten in independent form including all of the limitations of cancelled base claim 1 and cancelled intervening claim 3, with

changes being made to the language of cancelled base claim 1 to eliminate the deficiencies identified by the Examiner.

Claims 14, 16-19 and 21 which previously depended from cancelled claim 1 have been amended to depend from independent claim 4, with claim 21 being amended to eliminate the deficiencies identified by the Examiner.

Claim 22 which previously depended from cancelled claim 1 has been amended to depend from independent claim 20 and to eliminate the deficiencies identified by the Examiner.

Claim 11 which previously depended from cancelled claim 2 has been amended to depend from independent claim 4.

Claims 5 and 12-13 which previously depended from cancelled claim 3 have been amended to depend from independent claim 8.

For the reasons discussed above, it is submitted that claims 4-14, 19, and 21-22 are now in compliance with 35 USC 112, second paragraph, and it is respectfully requested that the rejection of claims 4-14, 19, and 21-22 under 35 USC 112, second paragraph, be withdrawn.

Claims 1-3, 5, and 19 were rejected under 35 USC 103(a) as being unpatentable over Levran et al. (Levran) (U.S. Patent No. 5,982,645).

Claims 14-18 and 21-22 were rejected under 35 USC 103(a) as being unpatentable over Levran in view of Kageyama (U.S. Patent No. 5,612,581).

Claims 1-13 and 19 were rejected under 35 USC 103(a) as being unpatentable over Yeh (U.S. Patent No. 5,347,164) in view of Gephart et al. (Gephart) (U.S. Patent No. 4,709,318) and Mao (U.S. Patent No. 6,115,276).

Claims 14-18 and 21-22 were rejected under 35 USC 103(a) as being unpatentable over Yeh in view of Gephart, Mao, and Kageyama.

The rejections of claims 1-3 and 15 have been rendered moot by the cancellation of claims 1-3 and 15.

The rejections of claims 4-14, 16-19, and 21-22 are respectfully traversed insofar as these rejections may be deemed to be applicable to claims 4-14, 16-19, and 21-22 in their present form.

Claim 22 now depends from independent claim 20 which, as discussed above, has not actually been rejected, and accordingly is considered to be in condition for allowance. Accordingly, it is submitted that claim 22 is allowable at least by virtue of its dependency from allowable claim 20, and it is respectfully requested that the rejections of claim 22 under 35 USC 103(a) as being unpatentable over Levran, Kageyama, Yeh, Gephart, and Mao be withdrawn.

Independent claim 4 now recites a power supply comprising an AC/DC converter which receives AC power having an AC input voltage, converts the AC power into DC power, and outputs the DC power, the AC/DC converter including a control circuit which controls an output voltage of the DC power output from the AC/DC converter, wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage higher than an effective value of the AC input voltage, a DC/DC converter which receives the DC power from the AC/DC converter and controls a level of an output voltage of the DC/DC converter to be

equal to a level of a voltage to be used by a load to provide a controlled output voltage of the DC/DC converter while the DC/DC converter supplies the controlled output voltage of the DC/DC converter to the load, a DC converter which is connected to an input of the DC/DC converter, and a DC power storage means which supplies electric power to the DC/DC converter through the DC converter, wherein the DC converter is bidirectional to enable the DC converter to charge and discharge the DC power storage means, wherein the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means while the DC converter supplies the electric power received from the DC power storage means to the input of the DC/DC converter, wherein the DC converter includes a first converter having an AC terminal, and a DC terminal connected to the input of the DC/DC converter, a transformer having a high-voltage side winding connected to the AC terminal of the first converter, and a low-voltage side winding, and a second converter having an AC terminal connected to the low-voltage side winding, and a DC terminal connected to the DC power storage means, and wherein the transformer separates the DC power storage means from the AC/DC converter and from the DC/DC converter.

Independent claim 8 now recites a power supply comprising an AC/DC converter which receives AC power having an AC input voltage, converts the AC power into DC power, and outputs the DC power, the AC/DC converter including a control circuit which controls an output voltage of the DC power output from the AC/DC converter, wherein the control circuit controls the

output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage higher than an effective value of the AC input voltage, a DC/DC converter which receives the DC power from the AC/DC converter and controls a level of an output voltage of the DC/DC converter to be equal to a level of a voltage to be used by a load to provide a controlled output voltage of the DC/DC converter while the DC/DC converter supplies the controlled output voltage of the DC/DC converter to the load, a DC converter which is connected to an input of the DC/DC converter, and a DC power storage means which supplies electric power to the DC/DC converter through the DC converter, wherein the DC converter is bidirectional to enable the DC converter to charge and discharge the DC power storage means, wherein, when electric power is interrupted or the AC/DC converter cannot maintain sufficient electric power output to be consumed by the load, the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means while the DC converter supplies the electric power from the DC power storage means to the input of the DC/DC converter, wherein the DC converter includes a first converter having an AC terminal, and a DC terminal connected to the input of the DC/DC converter, a transformer having a high-voltage side winding connected to the AC terminal of the first converter, and a low-voltage side winding, and a second converter having an AC terminal connected to the low-voltage side winding, and a DC terminal connected to the DC power storage means, and wherein the transformer separates the DC power storage means from the AC/DC converter and from the DC/DC converter.

The feature of claims 4 and 8 wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage higher than an effective value of the AC input voltage has not previously been recited in the claims, and is described, for example, on page 6, lines 24-26, of the specification.

The feature of claims 4 and 8 wherein the transformer separates the DC power storage means from the AC/DC converter and from the DC/DC converter has not previously been recited in the claims, and is described, for example, on page 5, line 27, through page 6, line 18, of the specification.

It is submitted that Levran, Kageyama, Yeh, Gephart, and Mao do not disclose or suggest the feature of claims 4 and 8 discussed above wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage higher than an effective value of the AC input voltage, or the feature of claims 4 and 8 discussed above wherein the transformer separates the DC power storage means from the AC/DC converter and from the DC/DC converter, particularly in combination with all of the other features recited in claims 4 and 8.

Since Levran, Kageyama, Yeh, Gephart, and Mao do not disclose or suggest the features of independent claims 4 and 8 discussed above, it is submitted that independent claims 4 and 8 and claims 5-7, 9-14, 16-19, and 21 depending from independent claims 4 and 8 patentably distinguish over Levran, Kageyama, Yeh, Gephart, and Mao in the sense of 35 USC 103(a), and it is respectfully requested that the rejections of claims 4-14, 16-19, and 21 under

35 USC 103(a) as being unpatentable over Levran, Kageyama, Yeh, Gephart, and Mao be withdrawn.

Although dependent claims 5-7, 9-14, 16-19, and 21-22 are considered to be allowable by virtue of their dependency from allowable independent claims 4, 8, and 20, it is noted that these dependent claims also recite further features of the present invention which are not seen to be disclosed or suggested by the prior art.

It is submitted that all of the Examiner's rejections have been overcome, and that the application is now in condition for allowance. Reconsideration of the application and an action of a favorable nature are respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (500.38034CX1).

Respectfully submitted,

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Attachment

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Changes made to the application by the present amendment are indicated below, with brackets indicating deleted matter and underlining indicating added matter.

IN THE TITLE

The replacement title presented in the amendment of December 21, 2000, has been deleted and replaced with the following replacement title:

--POWER SUPPLY WITH [UNINTERRUPTED] UNINTERRUPTIBLE FUNCTION--

IN THE CLAIMS

Claims 1-3 and 15 have been cancelled without prejudice or disclaimer of the subject matter thereof.

Claims 4-14 and 16-22 have been amended as follows:

--4. (Amended) A power supply [according to Claim 2,] comprising:

an AC/DC converter which receives AC power having an AC input voltage, converts the AC power into DC power, and outputs the DC power, the AC/DC converter including a control circuit which controls an output voltage of

the DC power output from the AC/DC converter, wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage higher than an effective value of the AC input voltage;

a DC/DC converter which receives the DC power from the AC/DC converter and controls a level of an output voltage of the DC/DC converter to be equal to a level of a voltage to be used by a load to provide a controlled output voltage of the DC/DC converter while the DC/DC converter supplies the controlled output voltage of the DC/DC converter to the load;

a DC converter which is connected to an input of the DC/DC converter; and

a DC power storage means which supplies electric power to the DC/DC converter through the DC converter;

wherein the DC converter is bidirectional to enable the DC converter to charge and discharge the DC power storage means;

wherein the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means while the DC converter supplies the electric power received from the DC power storage means to the input of the DC/DC converter;

wherein [said] the DC converter includes:

a first converter having an AC terminal, and a DC terminal connected to [said] the input of [said] the DC/DC converter;

a transformer having a high-voltage side winding connected to [said] the AC terminal of [said] the first converter, and a low-voltage side winding; and

a second converter having an AC terminal connected to [said] the low-voltage side winding, and a DC terminal connected to [said] the DC power storage means; and

wherein the transformer separates the DC power storage means from the AC/DC converter and from the DC/DC converter.

5. (Amended) A power supply according to [Claim 3] 8, wherein [said] the DC converter is connected to an output side of [said] the AC/DC converter so that [said] the DC converter controls an output voltage of [said] the DC converter to be lower than an output side voltage of [said] the AC/DC converter while [said] the DC converter outputs [said] the electric power from [said] the AC/DC converter to thereby charge [said] the DC power storage means.

6. (Amended) A power supply according to [Claim] claim 4, wherein [said] the DC converter is connected to an output side of [said] the AC/DC converter so that [said] the DC converter controls an output voltage of [said] the DC converter to be lower than an output side voltage of [said] the AC/DC converter while [said] the DC converter outputs [said] the electric power from [said] the AC/DC converter to thereby charge [said] the DC power storage means.

7. (Amended) A power supply according to [Claim] claim 6, wherein each of [said] the first and second converters performs power conversion based on [the basis of] ON/OFF actuation of a semiconductor switching device contained in each of [said] the first and second converters.

8. (Amended) A power supply [according to Claim 3,] comprising:

an AC/DC converter which receives AC power having an AC input voltage, converts the AC power into DC power, and outputs the DC power, the AC/DC converter including a control circuit which controls an output voltage of the DC power output from the AC/DC converter, wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage higher than an effective value of the AC input voltage;

a DC/DC converter which receives the DC power from the AC/DC converter and controls a level of an output voltage of the DC/DC converter to be equal to a level of a voltage to be used by a load to provide a controlled output voltage of the DC/DC converter while the DC/DC converter supplies the controlled output voltage of the DC/DC converter to the load;

a DC converter which is connected to an input of the DC/DC converter; and

a DC power storage means which supplies electric power to the DC/DC converter through the DC converter;

wherein the DC converter is bidirectional to enable the DC converter to charge and discharge the DC power storage means;

wherein, when electric power is interrupted or the AC/DC converter cannot maintain sufficient electric power output to be consumed by the load, the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means while the DC converter supplies the electric power from the DC power storage means to the input of the DC/DC converter;

wherein [said] the DC converter includes:

a first converter having an AC terminal, and a DC terminal connected to [said] the input of [said] the DC/DC converter;

a transformer having a high-voltage side winding connected to [said] the AC terminal of [said] the first converter, and a low-voltage side winding; and

a second converter having an AC terminal connected to [said] the low-voltage side winding, and a DC terminal connected to [said] the DC power storage means; and

wherein the transformer separates the DC power storage means from the AC/DC converter and from the DC/DC converter.

9. (Amended) A power supply according to [Claim] claim 8, wherein [said] the DC converter is connected to an output side of [said] the AC/DC converter so that [said] the DC converter controls an output voltage of [said] the DC

converter to be lower than an output side voltage of [said] the AC/DC converter while [said] the DC converter outputs [said] the electric power from [said] the AC/DC converter to thereby charge [said] the DC power storage means.

10. (Amended) A power supply according to [Claim] claim 9, wherein each of [said] the first and second converters performs power conversion based on [the basis of] ON/OFF actuation of a semiconductor switching device contained in each of [said] the first and second converters.

11. (Amended) A power supply according to [Claim 2] claim 4, further comprising a charger connected to an AC input for converting AC power into DC power and charging [said] the DC power storage means with [said] the DC power.

12. (Amended) A power supply according to [Claim 3] claim 8, further comprising a charger connected to an AC input for converting AC power into DC power and charging [said] the DC power storage means with [said] the DC power.

13. (Amended) A power supply according to [Claim 3] claim 8, wherein[: said] the AC/DC converter includes a power interruption [signal] detecting circuit which generates a power interruption detection signal when [said] the power

interruption detecting circuit detects interruption of [said] the AC [input] power and supplies the power interruption detection signal to the DC converter; and

wherein [said] the DC converter supplies DC power to [said] the DC/DC converter when [said] the power interruption detection signal is supplied to [said] the DC converter.

14. (Amended) A power supply according to [Claim 1] claim 4, wherein[: said] the AC/DC converter includes a plurality of unit AC/DC converters connected in parallel with one another;

wherein [said] the DC/DC converter includes a plurality of unit DC/DC converters connected in parallel with one another; and

wherein [said] the DC converter includes a plurality of unit DC converters connected in parallel with one another.--

--16. (Amended) A power supply according to [Claim 1] claim 4, further comprising a second DC/DC converter connected between an output of [said] the AC/DC converter and [said] the first-mentioned DC/DC converter;[,]

wherein[: said] the AC/DC converter outputs [said] the DC power to [said] the input of [said] the first-mentioned DC/DC converter through [said] the second DC/DC converter; and

wherein [said] the first-mentioned DC/DC converter includes a plurality of unit DC/DC converters connected in parallel with one another.

17. (Amended) A power supply according to [Claim 1] claim 4, further comprising a second DC/DC converter connected between an output of [said] the AC/DC converter and [said] the first-mentioned DC/DC converter;[,]

wherein[: said] the AC/DC converter outputs [said] the DC power to [said] the input of [said] the first-mentioned DC/DC converter through [said] the second DC/DC converter;

wherein [said] the first-mentioned DC/DC converter includes a plurality of unit DC/DC converter groups each of which is constituted by a plurality of unit DC/DC converters connected in parallel with one another; and

wherein [said] the plurality of unit DC/DC converter groups have a common input and supply electric power to independent load portions, respectively, constituting [said] the load.

18. (Amended) A power supply according to [Claim 1] claim 4, further comprising a second DC/DC converter connected between an output of [said] the AC/DC converter and [said] the first-mentioned DC/DC converter;[,]

wherein[: said] the AC/DC converter outputs [said] the DC power to [said] the input of [said] the first-mentioned DC/DC converter through [said] the second DC/DC converter; and

wherein [said] the first-mentioned DC/DC converter includes a plurality of unit DC/DC converters which have a common input connected to [said] the second DC/DC converter, and outputs for supplying electric power to independent load portions, respectively, constituting [said] the load.--

--19. (Amended) A power supply according to claim [1] 4, wherein [said] the control circuit controls [said] the output voltage of [said] the DC power of [said] the AC/DC converter to be equal to a predetermined DC voltage based on [the basis of] ON/OFF actuation of a semiconductor switching device of a main circuit of [said] the AC/DC converter and effects control to suppress harmonic current in the received AC power.

20. (Amended) A power supply [according to claim 15,] comprising a plurality of power supply units connected in parallel with one another, wherein each of said plurality of power supply units includes:

an AC/DC converter which receives AC power, converts said AC power into DC power, and outputs said DC power, said AC/DC converter including a control circuit which controls an output voltage of said DC power output from said AC/DC converter, wherein said control circuit controls said output voltage of said DC power of said AC/DC converter to be equal to a predetermined DC voltage;

a DC/DC converter which receives said DC power from said AC/DC converter, and controls a level of an output voltage of said DC/DC converter to be equal to a level of a voltage to be used by a load while said DC/DC converter supplies said output voltage to said load;

a DC converter which is connected to an input of said DC/DC converter; and

a DC power storage means which supplies electric power to said DC/DC converter through said DC converter, said DC converter being bidirectional to charge and discharge said DC power supply means;

wherein said control circuit controls said output voltage of said DC power of said AC/DC converter to be equal to a predetermined DC voltage on the basis of ON/OFF actuation of a semiconductor switching device of a main circuit of said AC/DC converter and effects control to suppress harmonic current in the received AC power.--

--21. (Amended) A power supply according to claim [1] 4, wherein [said] the DC converter includes a plurality of multiplexed DC converters connected in parallel. [in which each DC converter of the plurality of DC converters is selected in accordance with the load capacity and purpose of use.]

22. (Amended) A power supply according to claim [1] 20, wherein [said] the DC converter includes a plurality of multiplexed DC converters connected in parallel. [in which each DC converter of the plurality of DC converters is selected in accordance with the load capacity and purpose of use.]--